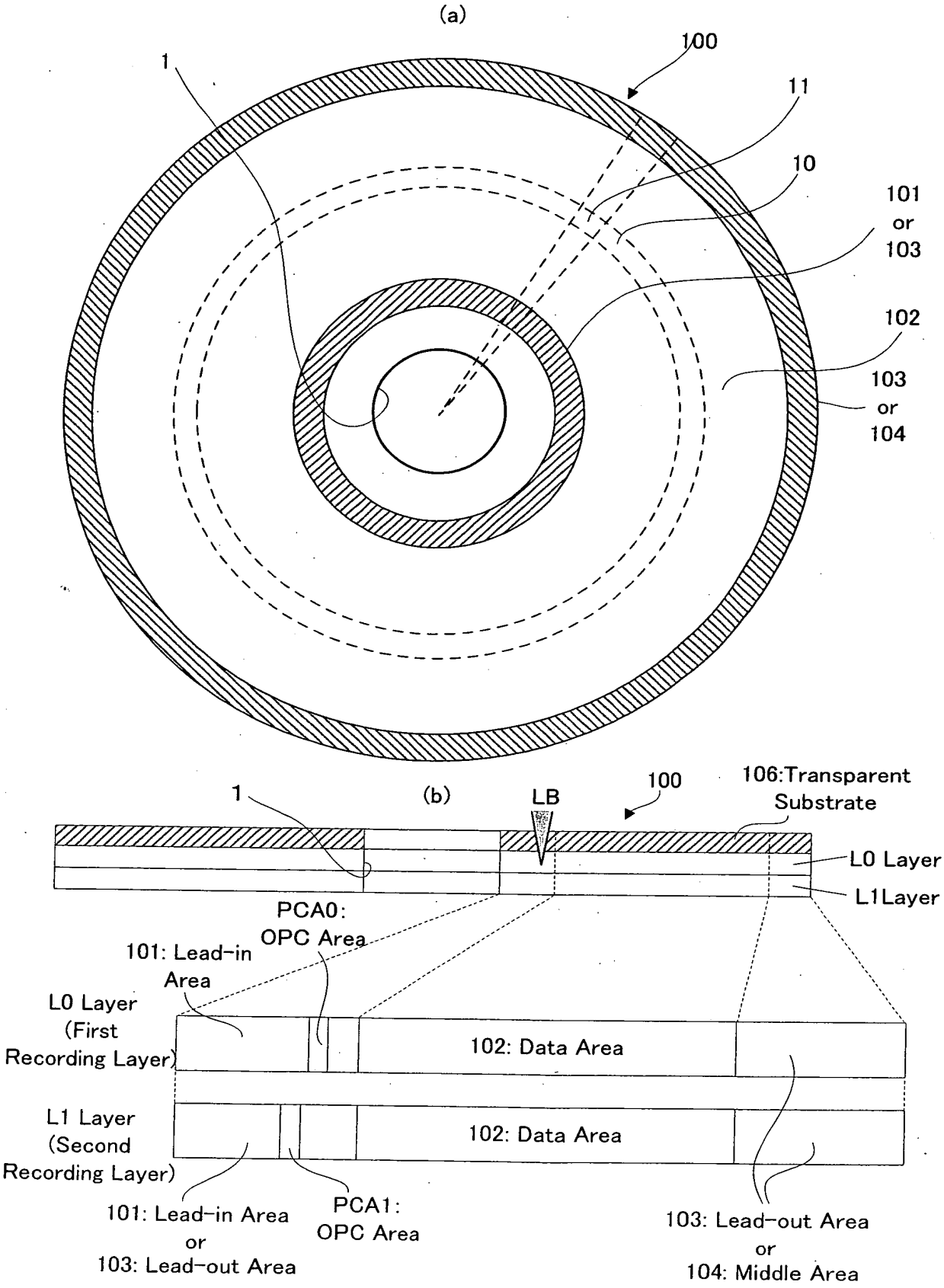
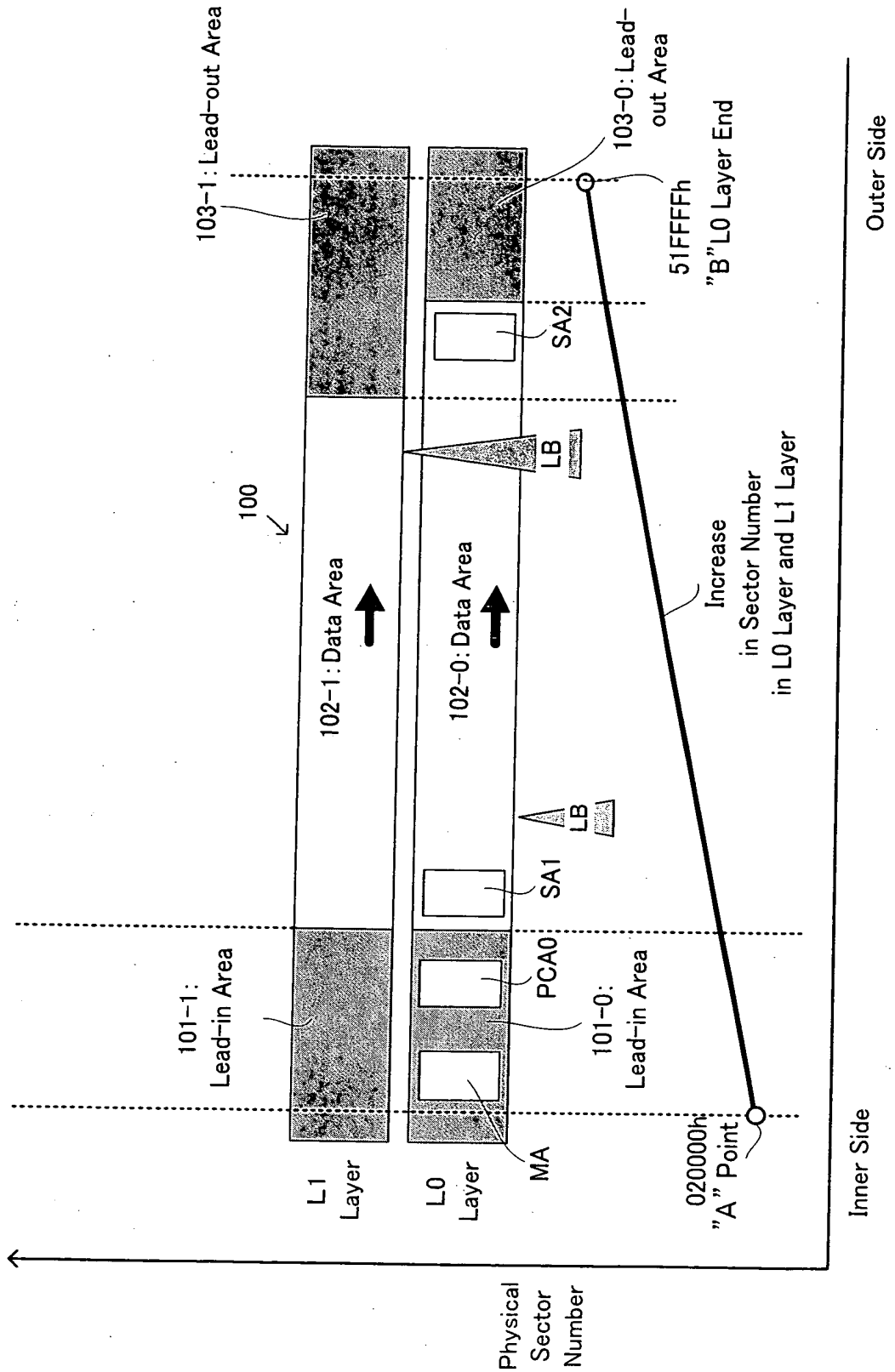
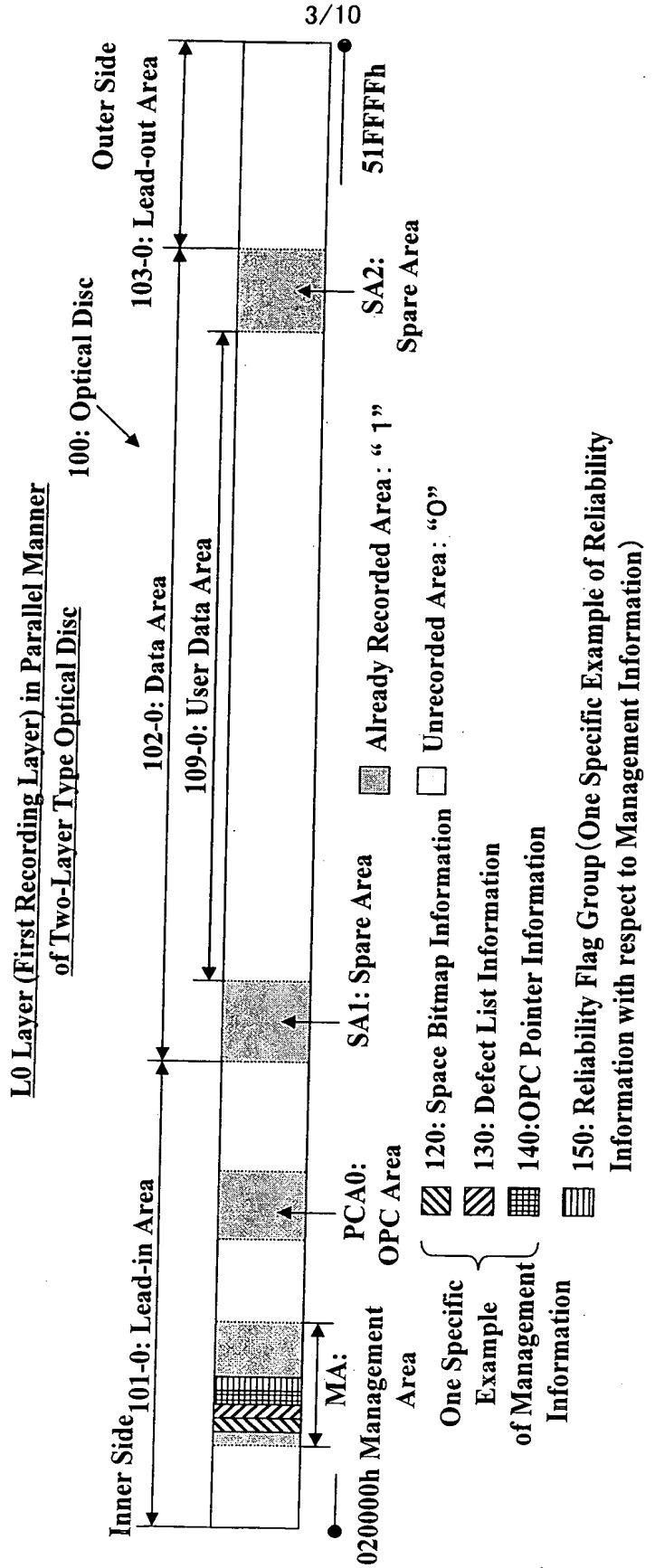
[FIG. 1]


(a)
100
1
11
10
101
or
103
102
103
or
104
(b)
1
LB
100
106:Transparent
Substrate
L0 Layer
L1Layer
PCA0:
OPC Area
101: Lead-in
Area
L0 Layer
(First
Recording Layer)
102: Data Area
L1 Layer
(Second
Recording Layer)
102: Data Area
101: Lead-in Area
or
103: Lead-out Area
PCA1:
OPC Area
103: Lead-out Area
or
104: Middle Area

[FIG. 2]


103-1: Lead-out Area
103-0: Lead-out Area
51FFFFh "B" L0 Layer End
Outer Side
SA2
LB
100
102-1: Data Area
102-0: Data Area
Increase in Sector Number in L0 Layer and L1 Layer
LB
SA1
101-1: Lead-in Area
PCA0
101-0: Lead-in Area
020000h "A" Point
L1 Layer
L0 Layer
MA
Inner Side
Physical Sector Number

[FIG. 3]

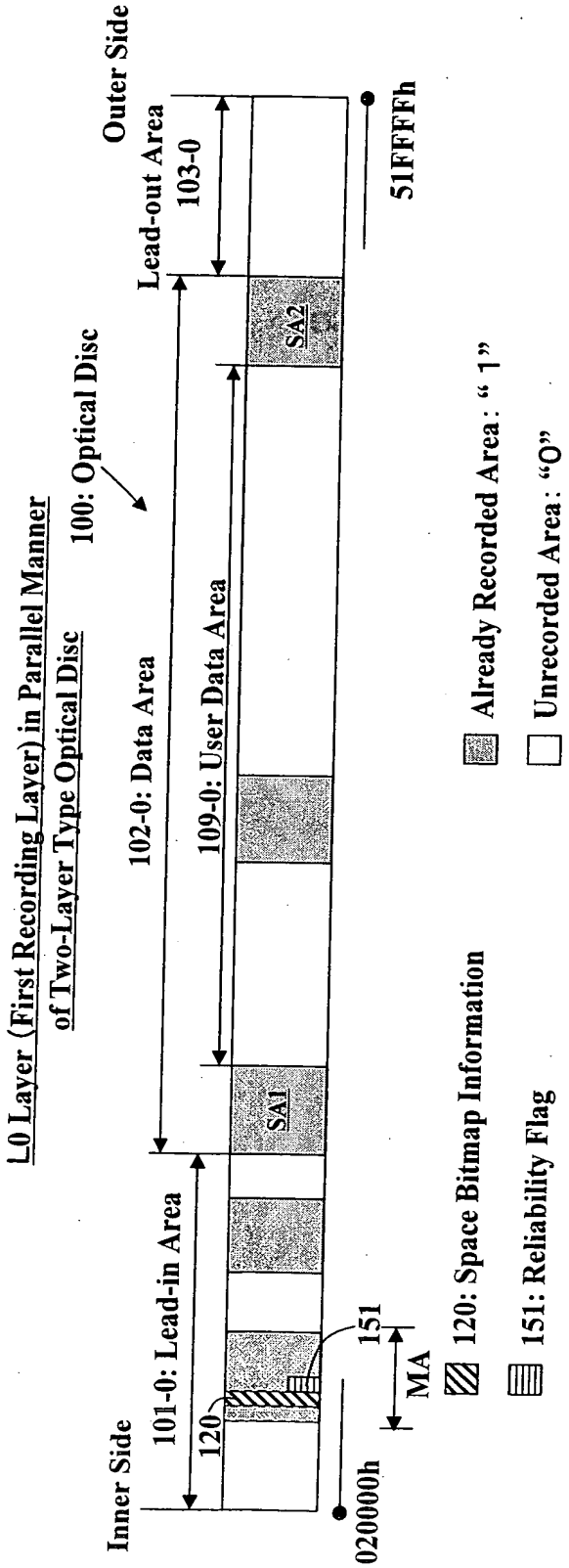

L0 Layer (First Recording Layer) in Parallel Manner of Two-Layer Type Optical Disc
100: Optical Disc
Outer Side
Inner Side
101-0: Lead-in Area
102-0: Data Area
103-0: Lead-out Area
109-0: User Data Area
020000h
51FFFFh
MA: Management Area
PCA0: OPC Area
SA1: Spare Area
SA2: Spare Area
Already Recorded Area: "1"
Unrecorded Area: "0"
One Specific Example of Management Information
120: Space Bitmap Information
130: Defect List Information
140:OPC Pointer Information
150: Reliability Flag Group (One Specific Example of Reliability Information with respect to Management Information)

[FIG. 4]

150: Reliability Flag Group

Sector Numbers of Head and Tail in Each Block in L0 Layer	120 L0 Layer Space Bitmap Info. (recorded 1, unrecorded 0)	150-S0 L0 Layer SBM	150-S1 L1 Layer SBM	150-D DFL	150-P OPC -P
20000 ~ 2FFFF	0				
30000 ~ 3FFFF	0				
40000 ~ 4FFFF	0				
50000 ~ 5FFFF	0				
60000 ~ 6FFFF	1				
70000 ~ 7FFFF	1				
80000 ~ 8FFFF	1				
90000 ~ 9FFFF	1				
A0000 ~ AFFFF	0				
B0000 ~ BFFFF	0				
C0000 ~ CFFFF	0				
D0000 ~ DFFFF	0				
E0000 ~ EFFFF	0				
F0000 ~ FFFFF	1				
100000 ~ 10FFFF	x0 (121)	1	0	0	0
⋮	⋮				
4D0000 ~ 4DFFFF	1				
4E0000 ~ 4EFFFF	0				
4F0000 ~ 4FFFFF	0				
500000 ~ 50FFFF	0				
510000 ~ 51FFFF	0				

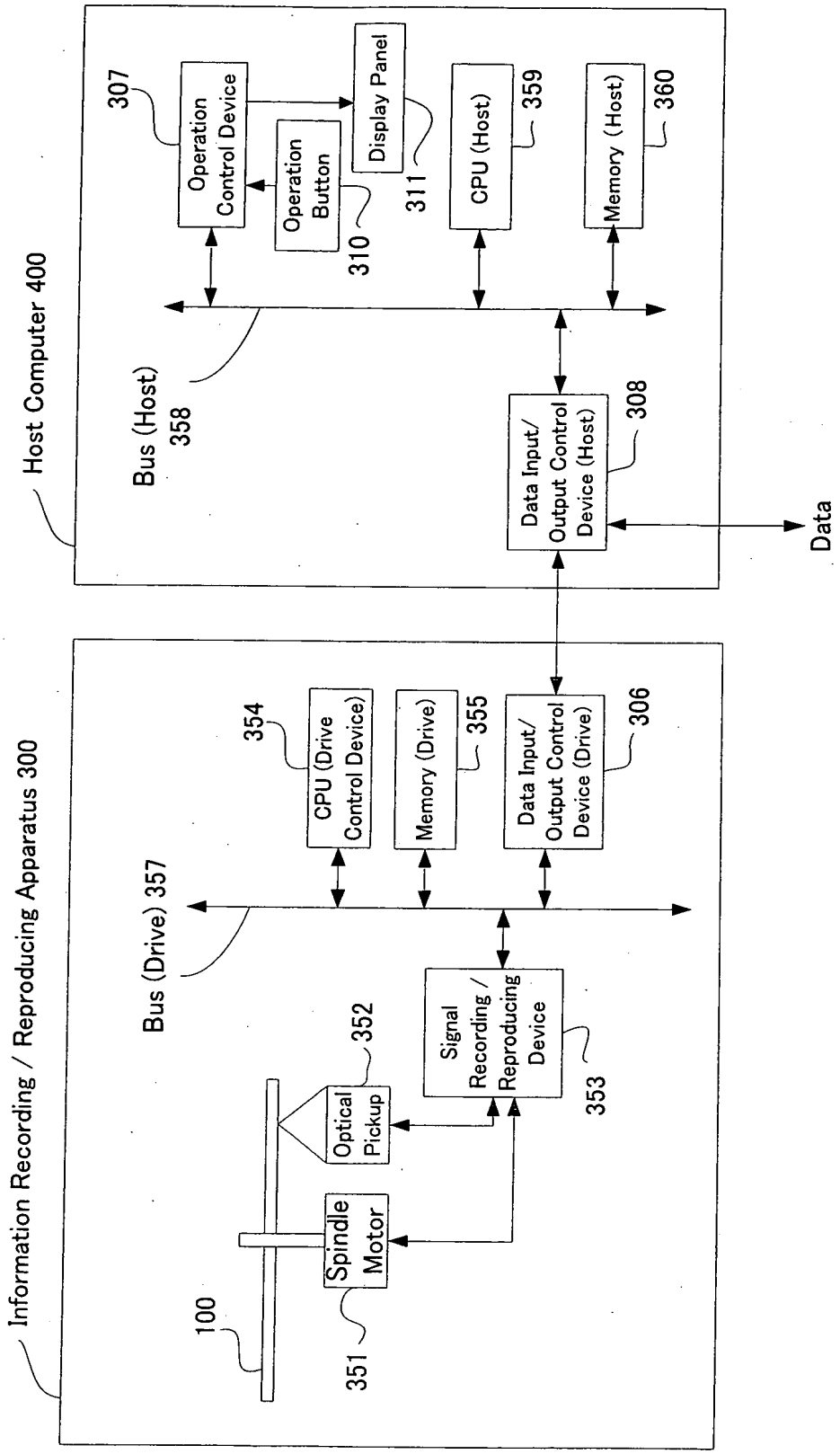
[FIG. 5]


L0 Layer (First Recording Layer) in Parallel Manner
of Two-Layer Type Optical Disc
100: Optical Disc
Outer Side
Inner Side
Lead-out Area
103-0
102-0: Data Area
109-0: User Data Area
101-0: Lead-in Area
SA1
SA2
120
151
MA
020000h
51FFFFh
120: Space Bitmap Information
151: Reliability Flag
Already Recorded Area: "1"
Unrecorded Area: "0"

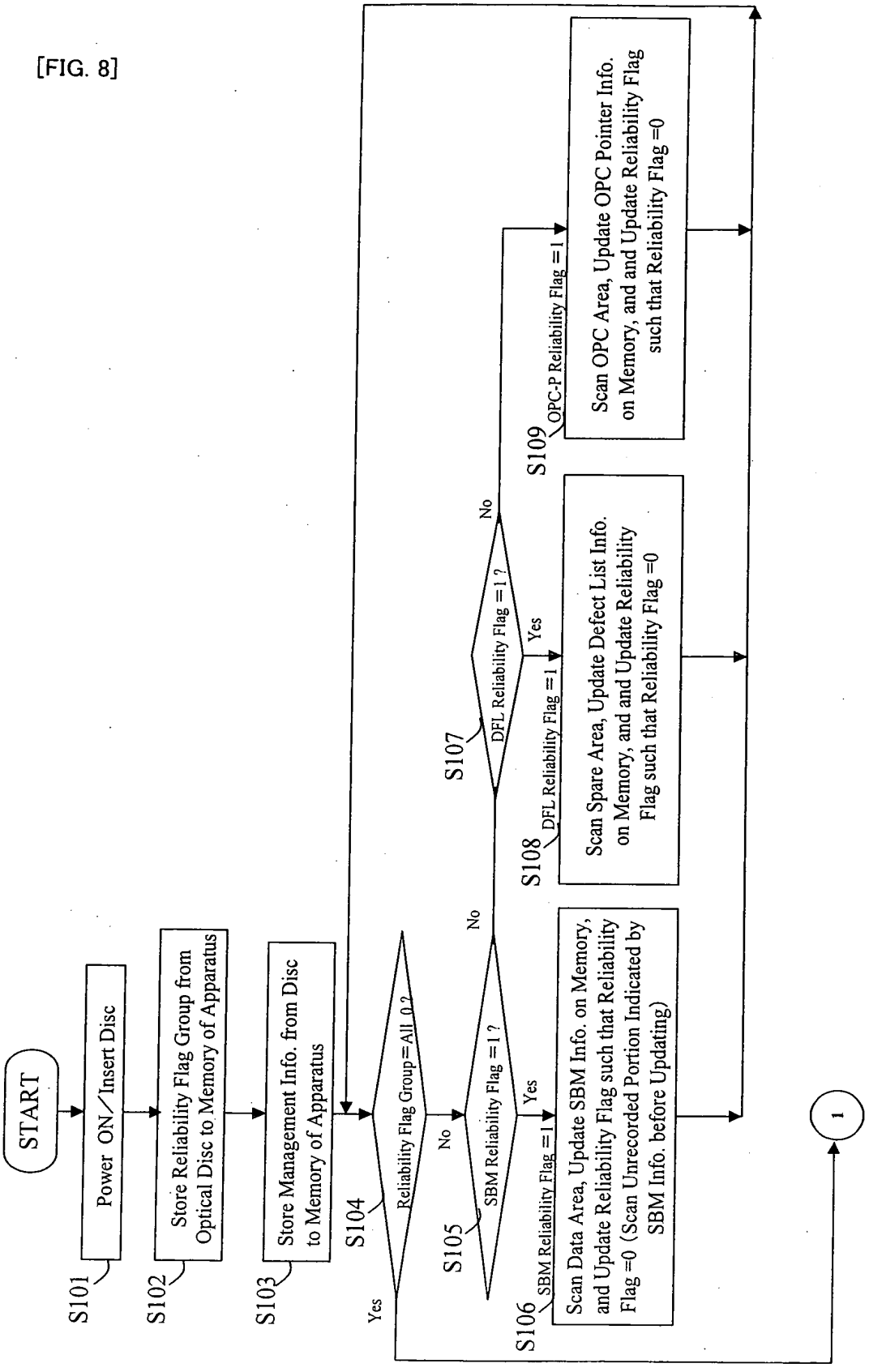
[FIG. 6]

Sector Numbers of Head and Tail in Each Block in L0 Layer	120 L0 Layer Space Bitmap Info. (recorded 1, unrecorded 0)	151 Reliability Flag (Updated 0, Not updated 1)
20000 ~ 2FFFF	1	
30000 ~ 3FFFF	1	
40000 ~ 4FFFF	1	
50000 ~ 5FFFF	1	
60000 ~ 6FFFF	1	
70000 ~ 7FFFF	1	
80000 ~ 8FFFF	1	
90000 ~ 9FFFF	1	
A0000 ~ AFFFF	0	
B0000 ~ BFFFF	0	
C0000 ~ CFFFF	0	
D0000 ~ DFFFF	0	
E0000 ~ EFFFF	0	
F0000 ~ FFFFF	1	
100000 ~ 10FFFF	x0 ... 121	1
:	:	
4D0000 ~ 4DFFFF	1	
4E0000 ~ 4EFFFF	1	
4F0000 ~ 4FFFFF	1	
500000 ~ 50FFFF	1	
510000 ~ 51FFFF	1	

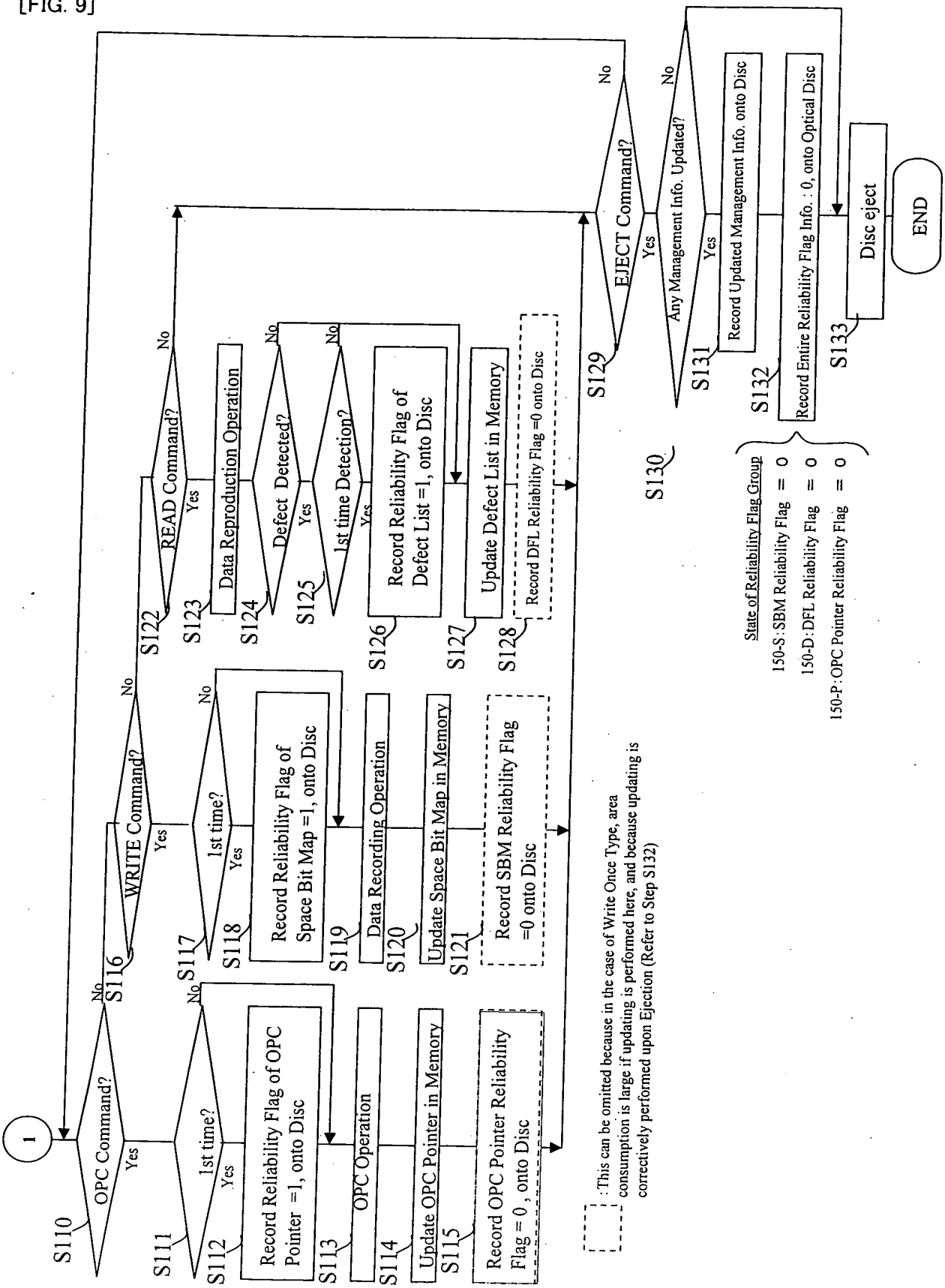
[FIG. 7]


Host Computer 400
307
Operation Control Device
Operation Button
310
Display Panel
311
CPU (Host)
359
Memory (Host)
360
Bus (Host) 358
Data Input/ Output Control Device (Host)
308
Data
Information Recording / Reproducing Apparatus 300
354
CPU (Drive Control Device)
Memory (Drive)
355
Data Input/ Output Control Device (Drive)
306
Bus (Drive) 357
Signal Recording / Reproducing Device
353
352
Optical Pickup
Spindle Motor
351
100

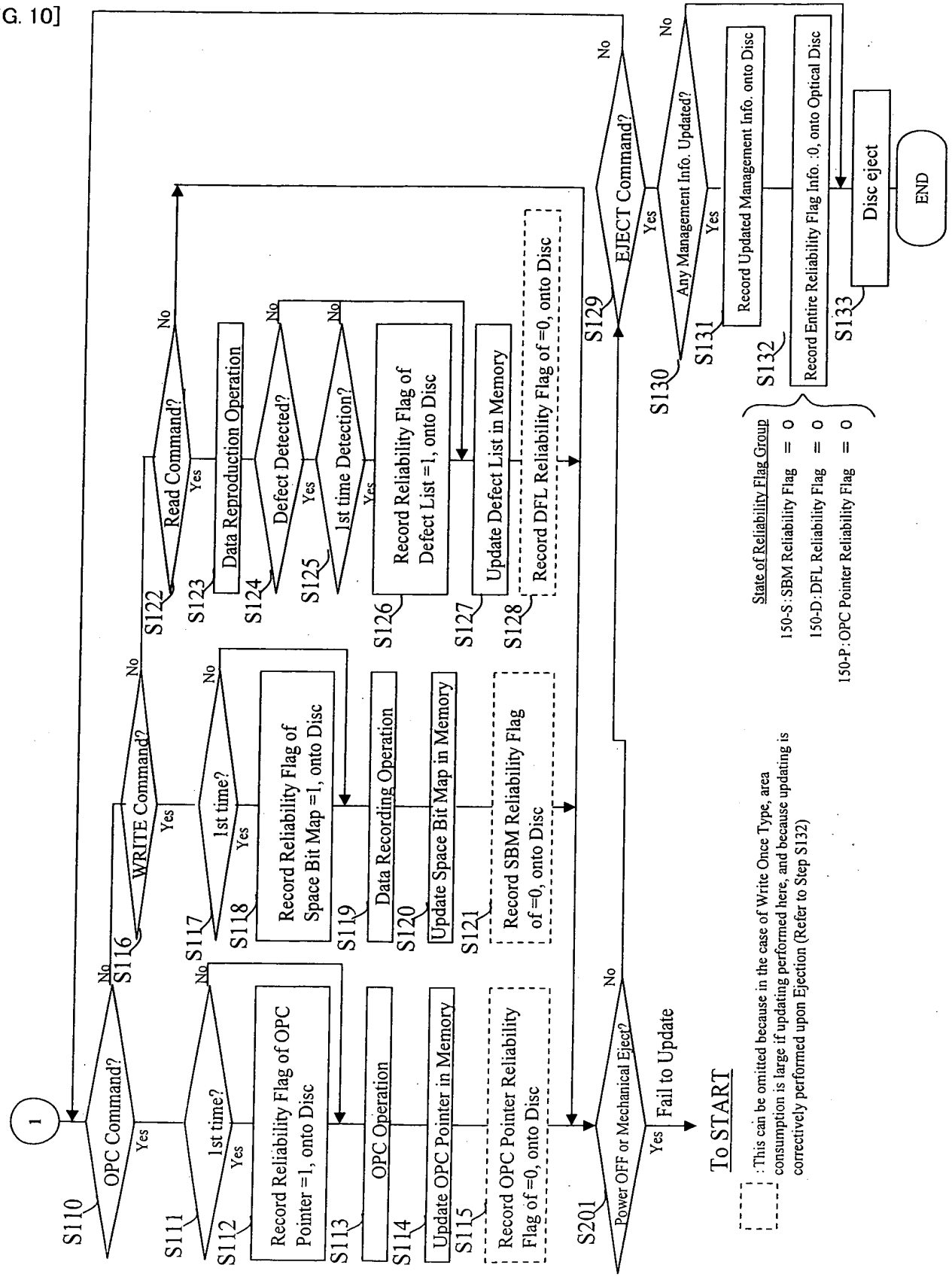
[FIG. 8]


START
Power ON/Insert Disc
S101
Store Reliability Flag Group from Optical Disc to Memory of Apparatus
S102
Store Management Info. from Disc to Memory of Apparatus
S103
Reliability Flag Group = All 0 ?
S104
Yes
No
SBM Reliability Flag = 1 ?
S105
Yes
No
SBM Reliability Flag = 1
S106
Scan Data Area, Update SBM Info. on Memory, and Update Reliability Flag such that Reliability Flag =0 (Scan Unrecorded Portion Indicated by SBM Info. before Updating)
DFL Reliability Flag = 1 ?
S107
Yes
No
DFL Reliability Flag = 1
S108
Scan Spare Area, Update Defect List Info. on Memory, and and Update Reliability Flag such that Reliability Flag =0
OPC-P Reliability Flag = 1
S109
Scan OPC Area, Update OPC Pointer Info. on Memory, and and Update Reliability Flag such that Reliability Flag =0
1

[FIG. 9]


1
S110
OPC Command?
Yes
No
S111
1st time?
Yes
No
S112
Record Reliability Flag of OPC Pointer =1, onto Disc
S113
OPC Operation
S114
Update OPC Pointer in Memory
S115
Record OPC Pointer Reliability Flag = 0 , onto Disc
S116
WRITE Command?
Yes
No
S117
1st time?
Yes
No
S118
Record Reliability Flag of Space Bit Map =1, onto Disc
S119
Data Recording Operation
S120
Update Space Bit Map in Memory
S121
Record SBM Reliability Flag =0 onto Disc
S122
READ Command?
Yes
No
S123
Data Reproduction Operation
S124
Defect Detected?
Yes
No
S125
1st time Detection?
Yes
No
S126
Record Reliability Flag of Defect List =1, onto Disc
S127
Update Defect List in Memory
S128
Record DFL Reliability Flag =0 onto Disc
S129
EJECT Command?
Yes
No
S130
Any Management Info. Updated?
Yes
No
S131
Record Updated Management Info. onto Disc
S132
Record Entire Reliability Flag Info. : 0, onto Optical Disc
S133
Disc eject
END
: This can be omitted because in the case of Write Once Type, area consumption is large if updating is performed here, and because updating is correctively performed upon Ejection (Refer to Step S132)
State of Reliability Flag Group
150-S : SBM Reliability Flag = 0
150-D : DFL Reliability Flag = 0
150-P : OPC Pointer Reliability Flag = 0

[FIG. 10]


1
S110
OPC Command?
Yes
No
S111
1st time?
Yes
No
S112
Record Reliability Flag of OPC Pointer =1, onto Disc
S113
OPC Operation
S114
Update OPC Pointer in Memory
S115
Record OPC Pointer Reliability Flag of =0, onto Disc
S116
WRITE Command?
Yes
No
S117
1st time?
Yes
No
S118
Record Reliability Flag of Space Bit Map =1, onto Disc
S119
Data Recording Operation
S120
Update Space Bit Map in Memory
S121
Record SBM Reliability Flag of =0, onto Disc
S122
Read Command?
Yes
No
S123
Data Reproduction Operation
S124
Defect Detected?
Yes
No
S125
1st time Detection?
Yes
No
S126
Record Reliability Flag of Defect List =1, onto Disc
S127
Update Defect List in Memory
S128
Record DFL Reliability Flag of =0, onto Disc
S129
EJECT Command?
Yes
No
S130
Any Management Info. Updated?
Yes
No
S131
Record Updated Management Info. onto Disc
S132
Record Entire Reliability Flag Info. :0, onto Optical Disc
S133
Disc eject
END
S201
Power OFF or Mechanical Eject?
Yes
No
Fail to Update
To START
: This can be omitted because in the case of Write Once Type, area consumption is large if updating performed here, and because updating is correctively performed upon Ejection (Refer to Step S132)
State of Reliability Flag Group
150-S: SBM Reliability Flag = 0
150-D: DFL Reliability Flag = 0
150-P: OPC Pointer Reliability Flag = 0